

(12) UK Patent Application (18) GB (11) 2 208 524 A

(43) Date of A publication 05.04.1999

(21) Application No 8708298.9

(22) Date of filing 07.04.1987

(71) Applicants

The Independent Engineering Company Limited

(Incorporated in the United Kingdom)

Cheltenham Road, Evesham, Worcester, WR11 6LH,
United KingdomPeter W G Whittall
49 Tobyfield Road, Bishops Cleeve, Cheltenham,
Glouce, United Kingdom

(72) Inventors

Gerald Ricketts

Peter W G Whittall

(74) Agent and/or Address for Service

Forrester Kelley & Co

Chamberlain House, Paradise Place,
Birmingham, B3 3HP, United Kingdom(51) INT CL^a

E05C 9/14

(52) UK CL (Edition J)

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(58) Field of search

UK CL (Edition J) E2A
INT CL^a E05B, E05C

(54) Espagnolette drive mechanism

(57) An espagnolette fastening mechanism for a door or window comprises a rack and pinion mechanism (22, 24) for transmitting drive from a rotary handle (17) to a reciprocating bar (12). The rack and pinion mechanism is mounted in a housing (21) which is separate from the bar (12). Projections (25) extend from the housing to engage recesses (28) in the bar.

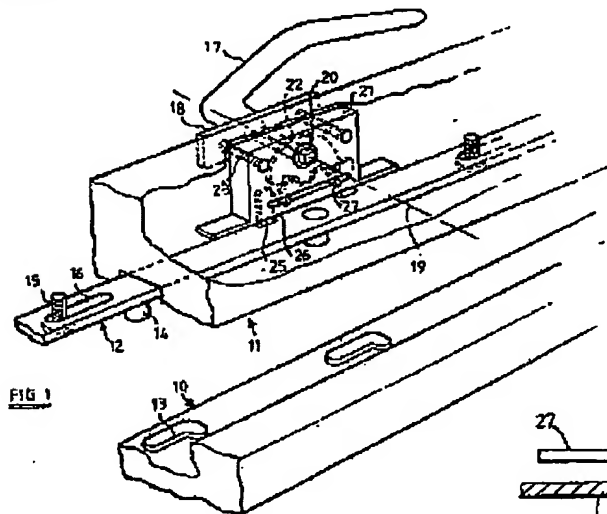


FIG 1

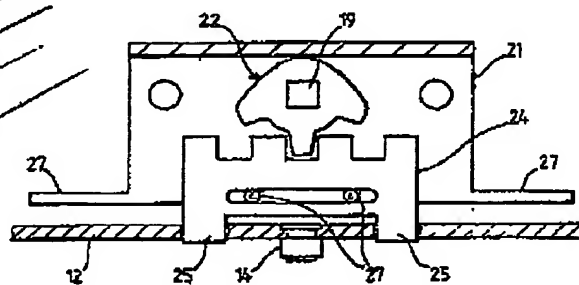
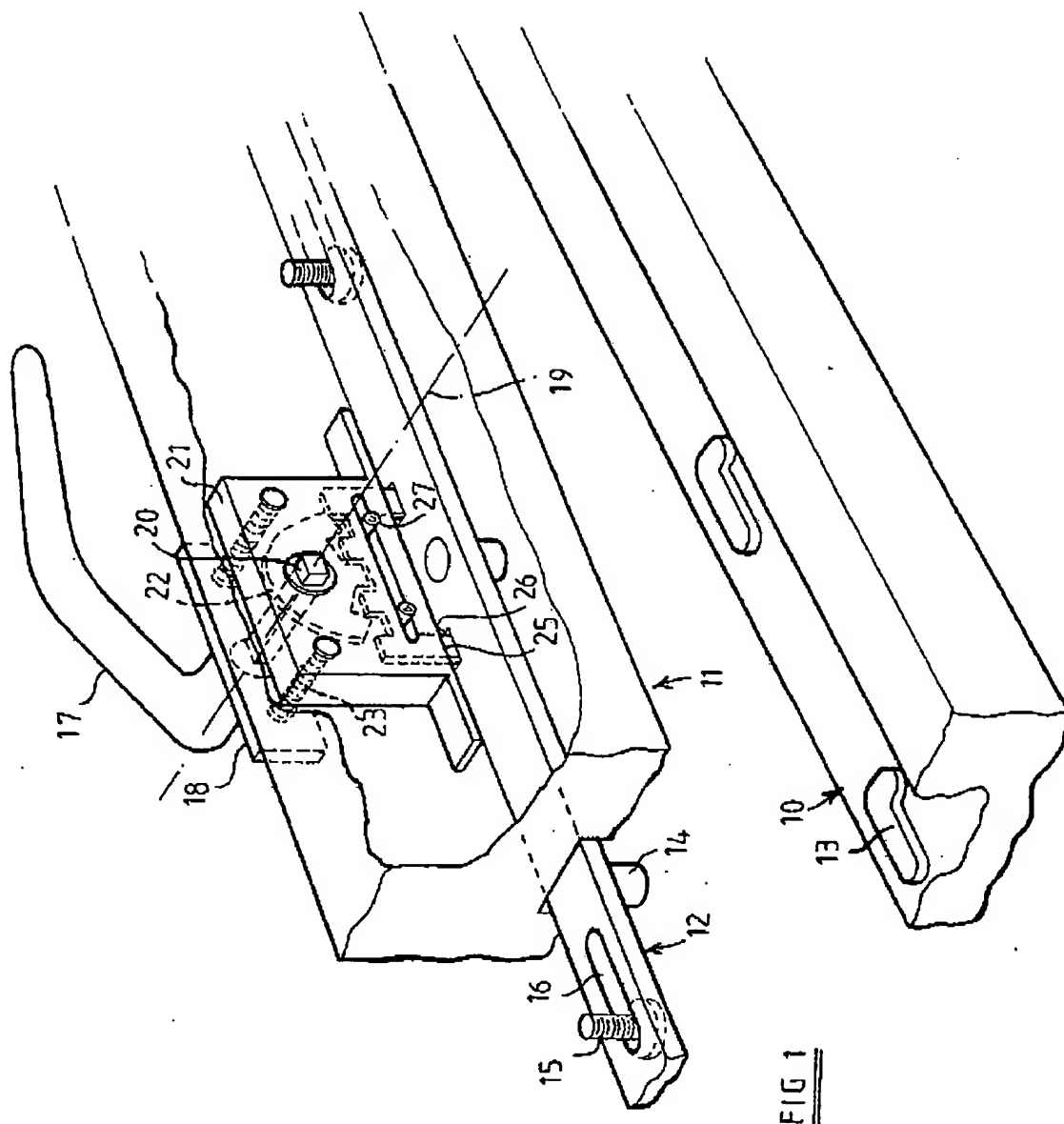


FIG 2

GB 2 208 524 A

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2/2

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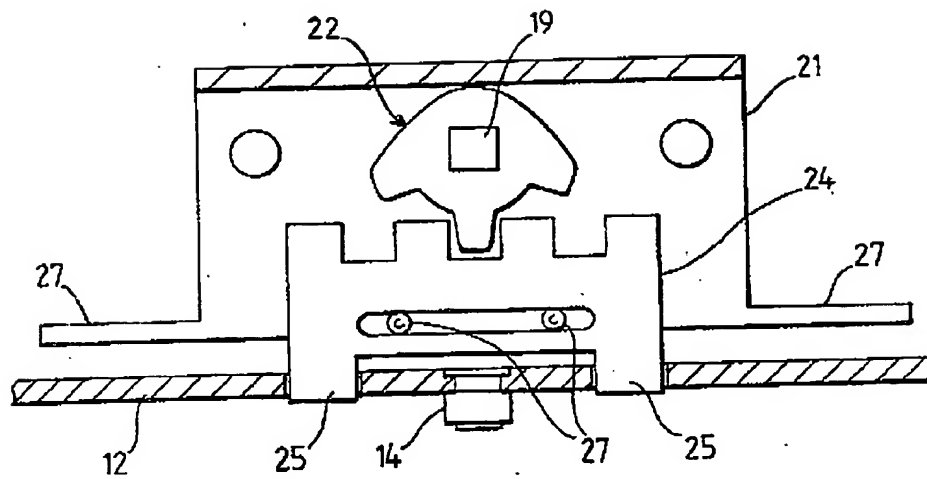


FIG. 2

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PATENTS ACT 1977

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Title: "Fastener drive mechanism and assembly incorporating same"

Description of Invention

From one aspect, the present invention relates to an assembly comprising a frame defining an opening and a closure member mounted for movement relative to the frame between closed and open positions, a handle mounted on the closure member for movement relative thereto, a bar mounted in the closure member for reciprocation relative thereto between a fastening position and a releasing position, co-operating fastening formations on the bar and on the frame for fastening the closure member in the closed position when the bar is in the fastening position and a drive mechanism which receives drive from the handle and transmits the drive to the bar. In an assembly of the kind described, the bar generally has two or more fastening formations which are spaced apart along the bar and which are spaced from the drive mechanism, the drive mechanism includes a rack which is coupled with the bar so that the bar reciprocates with the rack and the drive mechanism further comprises a drive element mounted for turning with the handle about an axis which is transverse to the length of the bar and which functions as a pinion to reciprocate the rack when the handle is turned.

In known assemblies of the kind described, the drive mechanism incorporates a housing within which the pinion or other drive element is mounted and within which the rack is disposed. A part of the bar also is disposed inside the housing, opposite end portions of the bar protruding from the housing. With this known arrangement, the drive mechanism and bar are assembled together permanently during manufacture and cannot subsequently be separated, without destruction of the housing.

The length of bar required varies from one assembly to another, depending upon the size of the closure member and upon the number of fastening formations required. A manufacturer of windows who accepts

- 2 -

orders for a large variety of sizes of windows must hold a stock of bars and drive mechanisms, the bars of which are different lengths.

5 In the known arrangement, the positional relation of the bar to the drive mechanism is determined during manufacture. In some examples, the drive mechanism is positioned centrally with respect to the length of the bar and with respect to the width of the bar. In other examples, a different positional relation is established during manufacture. If a window manufacturer requires choice as to the positional relation between the drive mechanism and the bar, he must carry a stock of suitable assemblies.

10 According to a first aspect of the present invention, there is provided an assembly of the kind described in which the drive mechanism is mounted in the closure member independantly of the bar. With this arrangement, the positional relation between the drive mechanism and the bar can be selected when these components are incorporated into the window. The bar may be adapted to co-operate with the drive mechanism at a selected one of a
15 plurality of alternative positions along the length of the bar and/or at a plurality of alternative positions across the width of the bar.

According to a second aspect of the invention, there is provided a drive mechanism for an assembly according to the first aspect, the drive mechanism comprising a housing, a boss mounted in the housing for turning
20 relative thereto about a rotary axis, a rack mounted partly in the housing and partly protruding therefrom in a first direction perpendicular to said axis and guide means for guiding the rack for reciprocation relative to the housing in a second direction perpendicular to both said first direction and to said axis, wherein the boss has at least one tooth engageable with the rack to
25 reciprocate the rack when the boss is turned about the axis.

An example of an assembly in accordance with the first aspect of the invention and embodying a drive mechanism according to the second aspect will now be described, with reference to the accompanying drawing,
30 wherein:-

FIGURE 1 shows a perspective view of a part of window assembly;

FIGURE 2 shows an elevation of a drive mechanism of the assembly of Figure 1, a wall of a housing of the drive mechanism being omitted to reveal
35 internal parts.

The assembly illustrated in Figure 1 comprises a rectangular frame, a part of which is shown at 10, which is mounted in an opening in a wall of a

- 3 -

building and is permanently fixed with respect to the wall. The frame defines a rectangular opening. The assembly further comprises a closure member, a part of which is indicated by the reference numeral 11. This closure member is also rectangular, is hingedly connected with the frame and is arranged for closing the opening defined by the frame. As illustrated in Figure 1, the closure member can swing relative to the frame to an open position. The closure member may incorporate a glazing panel and may be a door or an opening part of a window.

Fastening means is provided for fastening the closure member 11 in the closed position with respect to the frame 10. The fastening means includes an elongate, rectilinear bar 12 which is mounted in a channel defined by the closure member for reciprocation relative thereto through a limited stroke in a vertical direction, in a case where the bar is disposed at a vertical margin of the closure member 11, or in an horizontal direction, in a case where the bar is disposed at a horizontal margin of the closure member. Co-operating fastening formations are provided on the bar 12 and on the frame 10. In the example illustrated, the fastening formations on the frame are keepers 13 and the fastening formations on the bar 12 have the form of generally cylindrical projections 14 which may be constituted by rollers attached by rivets to the bar so that each roller can turn on its axis relative to the bar. Alternatively, the fastening elements on the bar may be fixed with respect to the bar.

The bar 12 is attached to the closure member 11 by means of a plurality of screws 15 or other headed fasteners which extend through elongated slots 16 formed in the bar and penetrate into the closure member 11. The screws 15 are spaced from each other along the bar and each slot 16 extends along a part of the length of the bar to permit free sliding of the bar between fastening and releasing positions.

There is also mounted on the closure member 11 a handle 17 connected with a base plate 18 for pivoting relative thereto about an axis 19 which extends generally in the direction of opening and closing movement of the closure member 11. The base plate 18 is mounted on a face of the closure member 11 which is presented towards the interior of the building and the handle 17 has a shaft 20 which protrudes from the base plate into the closure member 11.

A drive mechanism is provided for transmitting drive from the shaft 20 to the bar 12. The drive mechanism comprises a hollow housing 21 in which

- 4 -

there is mounted for turning relative to the housing a boss 22. The housing 21 is disposed in a recess formed in the closure member 11 and is so positioned that the rotary axis of the boss 22 coincides with the axis 19 of the shaft 20. The boss is formed with a non-circular aperture which receives the shaft 20 with a sliding fit. In the example illustrated, the transverse cross-sectional shape of the shaft and the shape of the aperture in the boss are square.

The base plate 18 and the housing 21 are both secured to the closure member 11 by a pair of screws 23 or other fasteners which lie at opposite sides of the axis 19 and extend through the base plate, through a wall of the closure member 11 into respective bores formed in the housing 21. The screws are threadedly engaged with the housing in these bores. The bores may be presented by stepped bushes which span the gap between opposed side walls of the housing 21 and are riveted over at the outsides of the housing.

The drive mechanism further comprises a rack 24 which is disposed partly in the housing 21 and which protrudes from that housing in a direction away from the axis 19 into coupling relation with the bar 12. In the example illustrated, the rack has adjacent to each of its ends a respective tooth 25 which protrudes from the housing 21 into a corresponding recess 26 formed in the bar 12. By means of the teeth 25, the rack is coupled with the bar 12 so that the bar reciprocates with the rack. Longitudinal movement of the rack may be limited by the housing 21 or by the bar 12.

The rack 24 is retained in the housing 21 and is guided for reciprocation relative to that housing along a rectilinear path by retaining elements 27 which protrude from opposite faces of the rack into rectilinear slots formed in the side walls of the housing 21. Preferably, two retaining elements engage in each slot to maintain a longitudinal centreline of the rack in parallel relation with a longitudinal centreline of the housing.

As shown in Figure 1, the housing 21 may be arranged with its longitudinal centreline offset laterally relative to a longitudinal centreline of the bar 12, the recesses 26 which receive the teeth 25 being immediately adjacent to a lateral margin of the bar. Alternatively, the recesses 26 may be formed centrally in the bar, in which case there would be no lateral offsetting of the drive mechanism relative to the bar.

There may be formed in the bar more than two recesses 26, so that a selected one of several alternative positional relations of the bar and drive mechanism can be adopted during assembly of the bar and drive mechanism with the closure member 11.

- 5 -

5 It will be noted that one of the projections 14 on the bar lies at a position between the two recesses 26 in which the teeth 25 are engaged. Thus, this projection is approximately aligned with the axis 19. If there is no requirement for a projection on the bar in this position and no requirement for any other formation on the bar at this position, then there may be substituted for the pair of teeth 25 on the rack a single tooth which engages in a single recess formed in the bar.

10 The housing 21 may be provided with oppositely directed flanges 27 which bear against the closure member 11 at opposite ends of the recess therein which receive the housing, in order to limit movement of the housing into that recess and so define the position of the housing and facilitate alignment of the housing with the base plate 18.

15 The frame 10 and closure member 11 may be assembled from extruded lengths of plastics material, for example UPVC from extruded lengths of aluminium or from lengths of timber. The drive mechanism, bar and associated parts of preferably formed of metallic materials.

20 The features disclosed in the foregoing description, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately or any combination of such features, be utilised for realising the invention in diverse forms thereof.

- 6 -

CLAIMS:

1. An assembly comprising a frame defining an opening, a closure member mounted for movement relative to the frame between closed and open positions, a handle mounted on the closure member for movement relative thereto, a bar mounted in the closure member for reciprocation relative thereto between fastening and releasing positions, co-operating fastening formations on the bar and the frame for fastening the closure member in the closed position when the bar is in the fastening position and a drive mechanism which receives drive from the handle and transmits the drive to the bar, wherein the drive mechanism is mounted in the closure member independantly of the bar.
2. An assembly according to Claim 1 wherein the drive mechanism includes a housing and a rack mounted in the housing and having a drive element protruding from the housing into a recess in the bar.
3. A drive mechanism for an assembly according to Claim 1, the drive mechanism comprising a housing, a boss mounted in the housing for turning relative thereto about a rotary axis, a rack mounted partly in the housing and partly protruding therefrom in a first direction perpendicular to said axis and guide means for guiding the rack for reciprocation relative to the housing in a second direction which is perpendicular to both said first direction and said axis, wherein the boss has at least one tooth engageable with the rack to reciprocate the rack when the boss is turned about the axis.
4. An assembly substantially as herein described with reference to the accompanying drawing.
5. Any novel feature or novel combination of features disclosed herein or in the accompanying drawing.